



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TEXAS 75202 – 2733

October 3, 2016

Ms. Lisa W. Jordan
Deputy Director
Tulane Environmental Law Clinic
6329 Freret Street
New Orleans, Louisiana 70118

Re: Request for Reconsideration of June 3, 2016, Approval of LDEQ's Amendments to the Water Quality Regulations regarding Dissolved Oxygen Criteria for Water Quality Subsegments in the Eastern Lower Mississippi River Alluvial Plains Ecoregion (LAC 33:IX.1123.Table 3) (WQ091)

Dear Ms. Jordan:

This letter is in response to your June 21, 2016, letter on behalf of the Gulf Restoration Network, Little Tchefuncte River Association, Louisiana Environmental Action Network, Sierra Club Delta Chapter and the Louisiana Audubon Council (collectively "Citizen Groups") requesting that the U.S. Environmental Protection Agency Region 6 (EPA) reconsider its June 3, 2016 approval of the above referenced amendments to the state of Louisiana's dissolved oxygen criteria for the Eastern Lower Mississippi River Alluvial Plains Ecoregion (LAC 33:IX.1123.Table 3) (WQ091). Citizen Groups request that EPA reconsider its decision and, at a minimum, partially disapprove LDEQ's proposed DO change as it applies to the Little Tchefuncte River, new subsegment 040807. Alternatively, Citizen Groups request that, at a minimum, EPA disapprove Louisiana's subsegment revision whereby it broke out new subsegment 040807 from subsegment 040801 and included 040807 in the eastern LMRAP Ecoregion.

In its June 3, 2016 decision, the EPA determined that the revisions developed and adopted by the Louisiana Department of Environmental Quality (LDEQ) in LAC 33:IX.1123.Table3 (WQ091) are based on sound science and protective of designated uses, and approved the revisions accordingly. Based on our initial findings and after consideration of the information provided in your June 21, 2016 letter, EPA denies your request for reconsideration. The reasons for our decision are discussed in the enclosed "Statement of Grounds for Denial of Request for Reconsideration." The EPA sincerely appreciates your efforts to protect water quality in Louisiana, values the input of citizen groups, and acknowledges the effort put into this request. If you have any questions or concerns, please contact Russell Nelson, of my staff, at (214) 665-6646 or at nelson.russell@epa.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read "WK Honker", is written over a horizontal line.

William K. Honker, P.E.
Director
Water Division

Enclosure

**Environmental Protection Agency Region 6
Statement of Grounds for Denial of Request for Reconsideration
of June 3, 2016, Approval of LDEQ's Amendments to the Water Quality
Regulations regarding Dissolved Oxygen Criteria for Water Quality Subsegments in
the Eastern Lower Mississippi River Alluvial Plains Ecoregion
(LAC 33:IX.1123.Table 3) (WQ091))**

Background:

On December 20, 2015, the Louisiana Department of Environmental Quality (LDEQ) adopted revisions to Louisiana's Surface water quality standards (WQS) at LAC 33:IX.1123, Table 3. These consisted of dissolved oxygen (DO) criteria revisions for freshwater and tidally influenced inland streams in subsegments located within the Eastern Lower Mississippi River Alluvial Plains (eLMRAP) ecoregion, as well as boundary refinements for 42 subsegments. LDEQ refers to the rule as WQ091. The revisions for the eLMRAP ecoregion revised the DO criteria for 31 inland streams to 2.3 mg/L for the months of March through November; for the months of December through February, the DO criteria for inland streams remains 5.0 mg/L (inland areas) or 4.0 mg/L (estuarine areas). The revisions were based on findings from a use attainability analysis of inland rivers and streams in the eLMRAP ecoregion titled *Use Attainability Analysis (UAA) of Inland Rivers and Streams in the Eastern Lower Mississippi River Alluvial Plains Ecoregion for Review of Dissolved Oxygen Water Quality Criteria* ("the eLMRAP UAA"). In addition, boundaries for 42 subsegments within the eastern eLMRAP, the southern plains terrace and flatwoods, the terrace uplands, and the coastal deltaic marshes ecoregions were refined based on watersheds. These boundary refinements resulted in the delineation of 21 new subsegments. On January 7, 2016, LDEQ submitted the revisions to the EPA for review pursuant to 40 CFR § 131.21.

On June 3, 2016, the EPA approved LDEQ's revisions to LAC 33:IX.1123.Table 3 (WQ091). The EPA discussed in detail its rationale for approval in its Technical Support Document (TSD) accompanying the approval action. As discussed in that document, the EPA determined that the state's revisions to its DO criterion for the eLMRAP extends the work previously done in the western section of the Lower Mississippi River Alluvial Plain (LMRAP) ecoregion in the Barataria and Terrebonne basins. This work was conducted during a previous UAA which refined and adjusted the DO criterion in the LMRAP to an appropriate value (the Barataria-Terrebonne UAA). The EPA concurred with the findings of the eLMRAP UAA that the DO Criteria established for streams in the western portion of the LMRAP were also appropriate for the eastern portion of the LMRAP. In its review of the state's DO revisions, the EPA considered the information received from your office via a March 8, 2016, letter entitled "Request for Disapproval of LDEQ's Amendments to the Water Quality Regulations regarding Dissolved Oxygen Criteria for Water Quality Subsegments in the Eastern Lower Mississippi River Alluvial Plains Ecoregion (LAC 33:IX.1123, Table 3)(WQ091)." In its June 3, 2016 TSD, EPA explained the basis for its conclusion that the state's revisions to its DO criteria are based on sound scientific rationale and discussed in detail its responses to the information and

concerns raised in the March 8, 2016 letter. Unless otherwise specified, the statements in this letter are based upon and supported by the June 3, 2016 TSD and information contained in documents that are part of the administrative record that the EPA considered when it reviewed and approved WQ091.

Specific Responses to Concerns noted by Citizen Groups in the June 21, 2016 Request for Reconsideration:

The Request for Reconsideration presents data collected by the Lake Pontchartrain Basin Foundation, and asks EPA to consider this as a demonstration that Northshore subsegments are meeting 5.0 mg/L DO year-round. Without any description of methodology used, the enclosed excel sheet cannot be used by EPA in determining compliance with the DO criteria. The data show only a single data point per sampling day; and does not provide the information that continuous monitoring data, with DO values every 15 minutes for 24-72 hours, would. The time of day for the sampling events was not included, which is also a major limitation of the dataset, as is the lack of any accompanying description of quality control/quality assurance used in the data collection. Dissolved oxygen varies throughout the day due to several different physical and chemical processes, including photosynthesis and bacterial respiration. Due to this temporal variation, knowing the time of the sampling event is critical for criteria determination. Without this additional information, the data cannot be used for criteria development, nor assessment.

EPA did not disregard the monitoring data Citizen Groups previously provided in making its determination to approve WQ091. However, as we explained in the June 3, 2016 TSD, monitoring “ambient” grab data for DO for criteria development is not as scientifically stringent as the use of continuously collected monitoring data. Although EPA’s 1986 criteria document for DO does not expressly state that 24-hour (diel) data must be used to develop the criteria, it does state that it is important to consider the magnitude of the minimum, and duration and frequency of the minimum. The guidance states that *determining the magnitude of daily DO cycles requires at least two appropriately timed measurements daily and characterizing the shape of the cycle requires several more appropriately spaced measurements* (page 35). Thus, continuous monitoring data allows for examination of the full DO cycle, taking into account the natural high and low points in DO that occur. In comparison, ambient grab samples are typically taken (presumably) at some point between 6 am and 12 pm, and may not account for diurnal swings in DO. The more holistic continuous monitoring is more suitable for establishing a criterion.

From a monitoring perspective, the appropriate times for monitoring are not generally known. Generally, DO decreases steadily from dusk to dawn and increases during the daylight hours. DO concentrations are a function of the interplay of a multitude of factors including but not limited to the time of day, water temperature, chlorophyll a concentrations, and climatic conditions. Therefore, to determine the DO minimums,

automatic data loggers (data sondes) are typically set to collect physio-chemical readings at pre-determined intervals over a 24-hr (or more) period. These data will document DO fluctuations due to flow, temperature and oxygen demand based on respiration of algae/phytoplankton during non-daylight hours. This diel approach is widely accepted and single grabs are not reliable at catching DO minimums unless it has been established (through diel sampling) that minimums at particular sites occur at a known time.

While ambient grab samples may show higher DO values, two considerations must be taken into account; first, higher DO levels do not necessarily reflect the natural conditions found in the ecoregion and instead can be an indication of hydromodification; second, as explained above, the criterion being set is a minimum -- higher concentrations do not preclude the use of a minimum criterion. Consider this paragraph from our criteria document – primarily the first 3 points:

The significance of conditions which fail to meet the recommended dissolved oxygen criteria depend largely upon five factors: (1) the duration of the event; (2) the magnitude of the dissolved oxygen depression; (3) the frequency of recurrence; (4) the proportional area of the site failing to meet the criteria; and (5) the biological significance of the site where the event occurs. Evaluation of an event's significance must be largely case- and site-specific. Common sense would dictate that the magnitude of the depression would be the single most important factor in general, especially if the acute value is violated. A logical extension of these considerations is that the event must be considered in the context of the level of resolution of the monitoring or modeling effort. Evaluating the extent, duration, and magnitude of an event must be a function of the spatial and temporal frequency of the data. Thus, a single deviation below the criterion takes on considerably less significance where continuous monitoring occurs than where sampling is comprised of once-a-week grab samples. This is so because based on continuous monitoring the event is probably small, but with the much less frequent sampling the event is not probably small and can be considerably worse than indicated by the sample.

Grab samples cannot satisfy the characterization of the first 3 factors above.

Specific Responses to Concerns noted by Citizen Groups in the March 8, 2016 Request for Disapproval:

As noted above, our June 3, 2016 approval TSD discussed in detail EPA's responses to the information and concerns cited in your March 8, 2016 letter. However, in light of your continued concerns about the use of continuous monitoring data versus the grab sample data you have provided and your concerns about the methodology in the 2008 Memorandum of Agreement (MOA), we believe further discussion might prove helpful. In addition, we further address the use of the 10th percentile for criterion development and the appropriateness of the subsegment revisions.

The 2008 Memorandum of Agreement (MOA) between LDEQ and EPA states that continuous monitors are to be deployed for 72 hours, to ensure 48 hours of data per run. The eLMRAP UAA states that data was collected for 24-72 hours (eLMRAP UAA pg 10.). The methodology for both the Barataria-Terrebonne UAA and the eLMRAP UAA called for the data to be truncated to increments of 24 hours, and only data points between 6 am and 12 pm were considered for the statistical analysis and development of the DO criterion. The 6 am to 12 pm time frame was used because ambient grab samples are collected during that time frame and because low DO usually occurs during that time frame.

EPA believes the methodology agreed upon in the 2008 MOA, calling for the use of continuous monitoring data, is scientifically acceptable and that the continuous monitoring conducted for the Barataria-Terrebonne and eLMRAP UAAs was within acceptable boundaries under this methodology because all data was consistently treated the same, as explained above. The MOA was intended to be a procedural guideline, and describes mutually agreed-upon protocols and methodologies consistent with EPA guidance. The MOA does not restrict LDEQ or EPA from exploring and developing other scientifically sound options for criteria development and assessment. Also, both agencies recognize that adjustments to methods and schedules may be necessary due to the unpredictable nature of fieldwork, where unforeseen needs and/or developments may arise. While 72 hour deployment of a continuous monitor may have been the target for the Barataria-Terrebonne and eLMRAP UAAs, the actual data collection may have covered less than 72 hours due to situational circumstances in the field, such as unexpected weather events that could impact the actual deployment/retrieval time of continuous monitors. EPA believes the guidelines outlined in the MOA are appropriate and scientifically supportable, and while 72 hours of data sonde deployment was a goal, datasets with a 24 hour duration are acceptable if data are collected during representative conditions.

You ask that EPA withdraw its approval and accept public comment on the January 10, 2008 MOA, stating that it was not previously made available for public comment. However, the January 10, 2008 MOA was previously available for public comment in 2008, as part of LDEQ's Notice of Intent to amend the DO criterion for Barataria and Terrebonne basins (LAC 33:IX.1105, 1113, 1123). Elizabeth Livingston de Caldrón of the Tulane Environmental Law Clinic submitted comments to LDEQ in a December 2, 2008 letter. EPA Region 6 considers the 2008 MOA to be fundamentally sound and that the methodology represents some consistency from ecoregion to ecoregion. As a result the Region does not intend to take additional comments on this document.

Dr. Burkholder's analysis noted concerns over the use of the 10th percentile in developing the DO criterion, citing a 2000 EPA document (U.S. EPA. *Ambient Water Quality Criteria Recommendations – Rivers and Streams in Nutrient Ecoregion X*. Report # EPA 822-B-01-016. Office of Water, U.S. EPA, Washington, DC.) This document makes recommendations for developing criteria for nutrients (i.e., nitrogen and phosphorus) in

rivers and streams. The recommendation to use the 75th percentile of reference stream data is intended for a criterion which requires a maximum limit to protect against nutrient pollution. An equivalent percentile level for DO would be the lower 25th percentile level, however, there is a range of acceptability for establishing the reference condition percentile level—it is not an absolute level that is used for all cases. We believe the 10th percentile is within the range of acceptability. For this ecoregion, LDEQ has demonstrated that DO tends to be naturally low. The criterion developed sets a minimum acceptable level, based on the natural conditions found at least-impacted reference streams within the ecoregion. LDEQ proposed using the lower 10th percentile of the reference data collected from 6 am to 12 pm (2008 MOA) to set the minimum criterion. This is more protective of aquatic life than using an absolute minimum.

As part of our review of WQ091, we examined the ambient monitoring data contained in the STORET database for streams within and surrounding the subsegments on the north shore of Lake Pontchartrain, as provided in your March 8, 2016 letter. The data was not collected using the more rigorous scientific methodology (continuous monitoring) as outlined in the 2008 MOA. Following the same statistical methods used to develop the 2.3 mg/L DO criterion, EPA calculated the 10th percentile of provided data collected within the critical period between 6 am and 12 pm. The resulting measurement was 2.6 mg/L. This slight difference is easily explained by the different data collection methodologies, and EPA R6 staff determined that the 2.3 mg/L DO criterion developed by LDEQ was the more accurate and scientifically defensible value.

Your letter requests that EPA partially disapprove LDEQ's proposed DO change as it applies to subsegment 040807 or that EPA disapprove LDEQ's subsegment revisions forming subsegment 040807 from subsegment 040801 and including subsegment 040807 in the eLMRAP ecoregion. You state that subsegments with portions outside of the eLMRAP ecoregion boundary should not be assigned a DO criterion equivalent to those subsegments completely within the LMRAP ecoregion boundary. Subsegment 040807 was split from subsegment 040801 to exclude drainage from the Southern Plains Terrace and Flatwoods ecoregions, and the eastern boundary was adjusted to exclude the Bogue Falaya River drainage. While a significant portion of subsegment 040807 lies outside the current LMRAP boundary, LDEQ found that it is ecologically similar to the LMRAP ecoregion. The upper boundary of subsegment 040807 was set to capture those areas of similarity, in terms of elevation, slope, land use and soils, as well as tributaries and headwaters, while maintaining a viable management unit in terms of size. Ecoregion boundaries in Louisiana, especially ecological transition zones such as the LMRAP ecoregion, are known to vary as the ecoregions are shaped by major ecological events, such as hurricanes. As LDEQ continues to evaluate and refine, if necessary, the DO criteria in other ecoregions of the state, ecoregion and subsegment boundaries may be revised as data becomes available.

Conclusion:

In our June 3, 2016 action, EPA determined that the revisions adopted by LDEQ in LAC 33:IX.1123.Table 3 (WQ091) are based on sound science and protective of the designated uses, and approved the amendments accordingly. Based on those initial findings and the information outlined above, EPA denies your Request for Reconsideration of June 3, 2016, approval of LDEQ's amendments to the Water Quality Regulations regarding Dissolved Oxygen Criteria for Water Quality Subsegments in the Eastern Lower Mississippi River Alluvial Plains Ecoregion (LAC 33:IX.1123.Table 3) (WQ091).